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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT PAPER NUMBER

1774

DATE MAILED: 09/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/761,696

Applicant(s)

LIU ET AL.

Examiner

Marie R. Yamnitzky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 and 70 is/are pending in the application.
- 4a) Of the above claim(s) 2,5,6,8,9,17-20,28,29,36,38 and 39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,7,10-16,21-27,30-35,37 and 70 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :rec'd 22 Jan 2004 & 25 May 2005.

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1. Applicant's response filed April 27, 2006 amends claims 10, 17, 21, 30, 38 and 39, and cancels claims 40-69.

Applicant's response filed June 30, 2006 amends claims 10, 17, 21, 30, 38 and 39, and adds claim 70.

Claims 1-39 and 70 are pending.

2. Applicant's election without traverse with respect to the restriction requirement in the reply filed on April 27, 2006 is acknowledged. Applicant elects Group I. As noted in the requirement mailed March 27, 2006, Groups I, II and III will be examined together, subject to an election of species.

Applicant's election without traverse with respect to the election of species requirements in the reply filed on June 30, 2006 is acknowledged. With respect to the species of charge transfer-promoting material, applicant elects $\{A-R^3\}^n M^{n+}$, and elects potassium triethoxysilylnapthalene as the ultimate species. Applicant did not explicitly state an election with respect to A, M and R^3 , but the ultimate species elected by applicant corresponds to an election of the species $\{A-R^3\}^n M^{n+}$ wherein A is an organic fused ring radical having from 2 to 5 rings, M is an alkali metal, and R^3 is an alkoxy silane. With respect to the species of electronic device, applicant elects an EL device.

Claims 1, 3, 4, 7, 10-16, 21-27, 30-35, 37 and 70 read on the elected Groups and the elected species. (Claim 7 depends from claim 2. Claim 2 does not explicitly read on the elected species, but claim 7 requires applicant's elected ultimate species. Claim 7 is hereby considered

with the expectation that either claim 7 should be depend from claim 1, or claim 7 must be interpreted as requiring more than one charge transfer-promoting material, one of which is within the scope of applicant's elected species and one of which is not.)

3. Claims 2, 5, 6, 8, 9, 17-20, 28, 29, 36, 38 and 39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on June 30, 2006.

4. While prior art is applied to some non-elected species in this Office action, this action does not represent an examination on the merits of all non-elected species within the scope of the present claims.

5. The disclosure is objected to because of the following informalities:

In paragraph [0039] on page 8, formulae (II) and (III) are said to represent triethoxysilylnaphthalene. The examiner notes that the name does not reflect the presence of an alkylene group between the naphthalene ring structure and the triethoxysilyl group as shown in either (II) or (III), and does not reflect that the triethoxysilylalkyl groups shown in (II) and (III) are at the 2-position of the naphthalene ring structure.

In paragraph [0042], it is stated that $K^+(NTES)^-$ can be represented by $\{A-R^1-Si-O-(OR^2)_3\}^n M^{n+}$. The examiner notes that, based on the structure of "NTES" as set forth in

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paragraph [0039], the first “O” after “Si” in $\{A-R^1-Si-O-(OR^2)_3\}^n M^{n+}$ in paragraph [0042] should be deleted.

Appropriate correction is required.

6. Claims 1, 3, 4, 7, 10-16, 21-27, 30-35, 37 and 70 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear if the formulae set forth in the Markush group of each of the independent claims represent complete formulae for the charge transfer-promoting material. For example, it is not clear if the formula AM limits the material to a material with a 1:1 ratio of A:M, or if a material such as represented by the formula A_2M is considered to have the formula AM.

Claim 7 requires the charge transfer-promoting material to comprise potassium triethoxysilylnaphthalene, but depends from claim 2. The Markush group set forth in claim 2 does not encompass potassium triethoxysilylnaphthalene. The Markush group set forth in claim 1 encompasses potassium triethoxysilylnaphthalene. It is not clear if claim 7 requires a combination of at least two different materials (in which case, the examiner suggests inserting --further-- before “comprising”), or if claim 7 should depend from claim 1.

It is not clear if the requirement for “potassium triethoxysilylnaphthalene” as recited in claims 7 and 16 requires a mixture of isomers of the potassium salt of NTES wherein NTES has the two structures represented by formulae (II) and (III) as shown on page 8 of the specification. The name “potassium triethoxysilylnaphthalene” does not reflect the presence of an alkylene

group between the naphthalene ring structure and the triethoxysilyl group as shown in either (II) or (III), and does not reflect that the triethoxysilylalkyl groups shown in (II) and (III) are at the 2-position of the naphthalene ring structure.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Horowitz et al. (US 4,033,852).

Horowitz et al. anticipate materials within the scope of present claims 1, 3 and 4 having the formula AM wherein A is a fused aromatic ring radical having two rings or a derivative of a fused aromatic ring radical having three rings, and M is the alkali metal sodium. For example, see column 3, lines 38-53.

9. Claim 70 is rejected under 35 U.S.C. 102(b) as being anticipated by Soffer (US 4,132,837) or Edelson (US 5,874,039).

Soffer anticipates an article as claimed in claim 70 wherein the charge transfer-promoting material has the formula $AM^{n+}X_n^-$ wherein A is a crown ether, cryptand, macrocyclic polyamine

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or derivative thereof, and M is an alkali metal or alkaline-earth metal. For example, see column 3, line 65-c. 4, l. 68, c. 5, l. 15-19 and l. 48-58, and the claims, especially claims 1-4, 11 and 12.

Edelson anticipates an article as claimed in claim 70 wherein the charge transfer-promoting material has the formula AM wherein A is a crown ether, cryptand, macrocyclic polyamine or derivative thereof, and M is an alkali metal, alkaline-earth metal, or lanthanide metal. For example, see the Figures, column 3, lines 12-29, c. 4, l. 18-c. 5, l. 17, c. 5, l. 34-50, and the claims, especially claims 1, 5, 7, 8 and 11.

10. Claims 1, 3, 4, 10-15, 21-26, 30-34, 37 and 70 are rejected under 35 U.S.C. 102(b) as being anticipated by Tang et al. (US 4,769,292).

See the whole patent. In particular, see column 8, lines 1-68, c. 34, l. 30-44, and c. 39, l. 44-c. 42, l. 40.

Tang et al. disclose chelates of oxine wherein the metal of the chelate may be an alkali metal or an alkaline earth metal. Such oxine chelates meet the limitations of a charge transfer-promoting material having the formula AM wherein A is a fused ring radical having two rings and derivatives thereof (presuming, in the case where M is an alkaline earth metal, the complete formula for the material is actually A_2M). For example, at c. 8, l. 64, Tang et al. disclose lithium oxine. Lithium oxine is a material of formula AM wherein A is a fused ring radical having two rings, and M is the alkali metal lithium. Lithium oxine is within the scope of present claims 1, 3 and 4, and meets the limitations of the charge transfer-promoting material required by claims 10-15, 21-26, 30-34, 37 and 70.

Tang et al. disclose the oxine chelates for use as a host material in a luminescent zone of an organic EL device. In the luminescent zone, the host material is used in combination with a fluorescent material. The device may also comprise a separate layer containing the host material without the fluorescent material wherein the separate layer is interposed between the luminescent zone and the cathode (e.g. see c. 34, l. 30-44).

With respect to recitation of “doped” in independent claim 30, the examiner reads no limitations into the claims with respect to relative amounts of charge transfer-promoting material and electronically active material.

With respect to present claims 14 and 15, devices in which the first and second metal are different, and devices in which the first and second metal comprise the same metal, are within the scope of Tang’s disclosure. For example, considering the first metal to be a metal in the cathode of Tang’s device, Tang provides for the use of chelates of oxine in which the metal is an alkali metal, but requires metals other than alkali metals for the cathode. Tang also provides for the use of chelates of oxine in which the metal is an alkaline earth metal, and teaches that alkaline earth metals are a preferred class of metals for use in the cathode. For example, see c. 40, l. 31-c. 42, l. 40.

With respect to present claims 22, 23 and 31, also see c. 40, l. 31-c. 42, l. 40. Further with respect to claim 23, aluminum is among the preferences taught at c. 42, l. 31-40.

With respect to present claims 24 and 32, poly(n-vinylcarbazole) may be included in any organic layer of the device as taught, e.g., at c. 39, l. 6-17. Various other materials recited in

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claims 24 and 32 are also disclosed in the prior art for use as the fluorescent material (e.g. see c. 11, l. 29-c. 33, l. 48).

With respect to present claims 25 and 33, organo-metallic complexes of 8-hydroxyquinoline (Tang's oxine chelates) may be used in more than one layer, and meet the limitation of the electronically active material, with some of Tang's oxine chelates also meeting the limitations of the charge transfer-promoting material.

The metal oxides recited in claims 26 and 34 for the second electrode are known in the art to be useful anode materials. Tin oxide and indium tin oxide are explicitly disclosed as conventional at c. 39, l. 50-54.

With respect to present claim 37, see c. 5, l. 4-9 and c. 6, l. 1-9.

11. Claims 1, 3, 4, 10-15, 21-27, 30-35 and 70 are rejected under 35 U.S.C. 102(b) as being anticipated by Kathirgamanathan (WO 02/43447).

See the whole publication. In particular, see page 2, line 18-p. 3, l. 11, p. 4, l. 12-14, p. 10, l. 11-15, p. 15, l. 21-p. 16, l. 18, and p. 20, l. 11-p. 22, l. 17.

Kathirgamanathan et al. teach that lithium quinolate may be used in a layer of an electron injecting material between a cathode and electroluminescent material of an organic EL device. As an alternative, the electron injecting material may be mixed with a hole transporting material and the electroluminescent material. For example, see p. 20, l. 11-24. Lithium quinolate is a material of formula AM wherein A is a fused ring radical having two rings, and M is the alkali

metal lithium. Lithium quinolate is within the scope of present claims 1, 3 and 4, and meets the limitations of the charge transfer-promoting material required by the other rejected claims.

With respect to recitation of “doped” in independent claim 30, the examiner reads no limitations into the claims with respect to relative amounts of charge transfer-promoting material and electronically active material.

With respect to present claims 14 and 15, considering the first metal to be a metal of Kathirgamanathan’s cathode, lithium may be included in the cathode, but is not required (e.g. see p. 20, l. 26-30). Accordingly, in a device according to the prior art in which lithium quinolate is used as an electron injecting material, the first and second metals may comprise the same metal or different metals.

With respect to present claims 22, 23 and 31, also see p. 20, l. 26-30.

Various materials within the scope of present claims 24, 25, 32 and 33 are disclosed in the prior art and may be mixed with the electron injecting material, or may be in one or more layers separate from the electron injecting material.

The metal oxides recited in claims 26 and 34 for the second electrode are known in the art to be useful anode materials. Indium tin oxide is explicitly taught at p. 15, l. 21-23.

With respect to present claims 27 and 35, see p. 21, l. 1-14.

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 27 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tang et al. (US 4,769,292) as applied to claims 1, 3, 4, 10-15, 21-26, 30-34, 37 and 70 above, and further in view of Onitsuka et al. (US 6,023,371).

Tang et al. do not disclose an EL device comprising a photoluminescent material disposed in a path of light emitted by the EL material.

The use of color filters on EL devices is well-known in the art. For example, see the patent to Onitsuka et al. It would have been an obvious modification to one of ordinary skill in the art at the time of the invention to provide a color filter on Tang's EL device.

14. Miscellaneous:

As a grammatical correction, "comprising" should be changed to --comprises-- in line 3 of claim 10, and in line 4 of claim 21.

Claims 21 and 30 define "M" as a "second metal", but do not explicitly require a first metal.

In line 3 of claims 24 and 32, "poly(praraphenylene)" should read --poly(paraphenylene)--.

In lines 4 and 5 of claims 25 and 33, "organo-metalic" should read --organo-metallic--.

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15. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
September 18, 2006



MARIE YAMNITZKY
PRIMARY EXAMINER

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